Services: File and Print

(1) Description/definition

An integral part of the DOE Architecture which stores data, office automation applications, LAN user profiles, Centralized print services, and certain development environments. These resources will most often be one of the LAN File Servers. This resource will likely be the first interface toward access to Department or organization wide data.

(2) Actions needed:

DOE should select a standard operating file & Print system to provide file & print services such as Microsoft NT. All file & print systems should be migrated to the standard. Users storage should be restricted to 50 meg per user, 250 meg per group. Public directories should be established to facilitate cross-organizational file sharing

(3) Timelines:

Soon
This should be done after the main PDC servers have been centralized.

(4) Benefits, costs and capital investment strategy

User

- Print services from anywhere
- Access to data from anywhere
- Dedicated private, managed data space
- File sharing between users and groups

Manager

- Reduce cost of administration
- Reduce risk such as loss of data, D/R, routine backup
- Reduce training requirement
- Increase uptime
- Reduce cost of development

Executive

- Reduce and manage risk
- Better utilization of budget resources
- Increased visibility of budget expenditure

(5) Management considerations

Mandatory Operational Policies

- Publish governance indicating that with in 24 months centralized File & Print services will be a service provided solely by the Infrastructure Support Team
- File servers are fully administered and supported by the centralized Infrastructure Support Team

(6) Other considerations:

Linkages, Prerequisites:

Common operating system selection

Common server platform selection

Services: e:mail

(1) Description/definition

System which facilitates the electronic transfer of messages and attachments between persistently connected and disconnected systems usually via a store & forward technology.

(2) Action needed:

Recommend consolidating all e:mail services into one platform, MS Exchange, within 12 months. The E:mail client should be standardized to MS Outlook

Migration of existing mail systems should be considered. Migrating old e:mail from other e:mail packages such as cc:Mail, NoteGroupWise, takes the most time and cost.

Alternative decision can be made to perform a simple cut over to new Email system without any migration of old E:mail. This migration methodology will save time and money in deployment cost. Need to determine user and mission impact.

Recommend a four phase approach**:**

Phase 1 - Discovery & Assessment
Phase 2 - Architecture, Design, & Testing
Phase 3 - Pilot Deployment
Phase 4 – Production Deployment

Phase I: Discovery & Assessment

- Gain a detailed technical understanding of the existing messaging environment
- Gain a high level understanding of the client's business environment
- Detailed Functional Requirements
- Preliminary Architecture and Design
- Preliminary Phase 2, 3, 4 Project Plans
- Review overall schedule, approach, resources and business impact

Phase 2: Architechture, Design & Testing

- Three Primary sub-tasks
  - Architecture and Engineering
  - Testing and Validation
  - Implementation Planning
- All technical details
- Initial documentation of project standards and policies
- Detailed Pilot planning and impact analysis

Phase 3: Pilot Deployment

- Ensure that all deployment assumptions are valid and the proposed support systems are adequate
- Ensure that the migration process impact to business critical functions is minimal
- Focused migration of 10-20% "sample"

- Preparation for company wide, global migration
- Optimization of all processes and strategies

Phase 4: Production deployment

- Migration of entire user base to new system
- Continue optimization of deployment processes based on site specific logistics and special needs
- Complete knowledge transfer to support organization

(3) Timelines:

In parallel with File & Print, i.e with 24 months.

(4) Benefits, costs and capital investment strategy

User

E-mails and attachments exchanged between internal and external systems
E-mail address books are accurate for all users
Ease of use
Increase in productivity & functionality

Manager

Reduce cost of administration
Reduce risk such as loss of data, D/R, routine backup. security
Reduce training requirement
Increase uptime
Reduce cost of development
Prerequisite for the following services
E-mail monitoring & management system
Unified messaging
Scheduling
Calendaring
Collaboration
Workflow application

Executive

Reduced and manage risk
Better utilization of budget resources
Better visibility of budget expenditure

(5)Management considerations: policy, governance

Management should consider some sites have implemented Notes specific applications. The goal should be to migrate Notes Applications to the MS Exchange platform with 12 months of e-mail roll out or migrate to Corporate Domino platform.

(6) Other considerations:

Establishment of a centralized Infrastructure support team
Establishment of polices to meet identified objectives

Services: Corporate Calendaring

(1) Description/definition

Ability to coordinate, schedule and deconflict people and resources such as shared conference rooms. Allow for public and private access, designation of permissions and authorities to read, write and modify calendars. View first available times for key participants and distribute e-mails for automated responses and reply to individuals and calendar with ability to add text, objects or files with the response. Ability to tile multiple calendars for display/update.

Integrated with e-mail standard. See that sheet

(2) Action needed:

Select primary standard product such as Outlook and establish business rules for implementation. Recommend response back from person vs automatic calendar scheduling.

(3) Timelines:

Parallel effort with e-mail application to enable ability to access calendars in work groups.

(4) Benefits, costs and capital investment strategy:

Reduced phone tag to schedule meetings
Improved use of shared facilities/resources
Method to track read-aheads or staff work for decision meetings
Coordinate-visable planning process

(5) Management considerations: policy, governance

Establish rules for adds/deletes - changes need to be tracked, identify POC and responsibilities for meeting preparation i.e, require completion of data fields such as date/time/location/POC/phone number/as pre-requisite for acceptance of appointment. Establish naming convention for calendars - personal and resource.

(6) Other considerations:

Linkages, Prerequisites
Link to e-mail implementation, directory and naming conventions.

Services: Messaging Services

(1) Description/definition

Similar to e-mail except additional sign for integrity of the message and ability to prioritize for procedures. Messaging usually adds requirements to authenticate release authority, address to organization vs person, frequently use group distribution lists based on subject/actions, confirmation of receipt, handle classification and be formatted to meet reporting requirements. May require encryption for protection of sensitive or classified information. Precedence system may require designated rapid response times.

(2) Action needed:

Message system should be integrated with IT network architecture when feasible. National emergency action message system will require additional resources to meet mission needs. Most "messages" should be able to travel over common user networks using COTS products as part of the Defense Messaging System.

(3) Timelines:

Priority on messae traffic dependant on AUTODIN. If not dependent, implement with phased approach based on user needs and establishment of "registration" authorities. Previously linked to PKI and electronics commerce, but other technical solutions have overcome DMS as a delivery tool for electroni business.

(4) Benefits, costs and capital investment strategy

Secure messaging with high confidence of content integrity and delivery
Improved information transfer security
Transmit and receive classified in a distributed manner
Increase ease of use/acces to "registered mail" capability

(5) Management considerations: policy, governance

(6) Other considerations:

Services: Video Conferencing

(1) Description/definition

Videoconference collaboration & communication services typically performed in a many-to-many, or many-to-one scenario.
This service is centrally maintained and managed by the Infrastructure Support Team.
Video Conferencing is performed on a scheduled basis from video-enabled conference rooms specifically configured to allow for large group collaboration.

(2) Action needed:

Provide single point of contact for the service
Transfer current videoconference assets to Infrastructure Support Team
Clarify the relationship between the Infrastructure Support Team and other entities responsible for rolling in necessary hardware, scheduling of conference rooms, and troubleshooting meetings.

(3) Timelines:

HQ 6 months

(4) Benefits, costs and capital investment strategy

Better utilization of existing equipment
Better service

(5) Management considerations: policy, governance

Single responsibility for the service across the entire DOE

(6) Other considerations:

Services: Desktop Collaboration

(1) Description/definition

Collaborative Tools refers to programs that help people work together collectively while located remotely from each other. Collaborative tools can include the sharing of calendars, collective writing, e-mail handling, shared database access, white boarding, desktop conferencing, electronic meetings with each person able to see and display information to others.

(2) Action needed:

Perform needs analysis to identify the necessary functionality. Select the solution/tool sets necessary to facilitate that functionality. Roll the client component of the tool set into the "Gold Disk" process.

(3) timelines:

6 months headquarters
12-24 months field

(4) Benefits, costs and capital investment strategy:

Users

Increases user productivity
Simple on the fly collaboration
No requirement for scheduling of conference room
Users don't have to leave their workspace to collaborate

Manager

Productivity
Perceived reduction in travel expense

Executive

Leverage investment in LAN WAN infrastructure
The greater the adoption of a standard the more the DOE will benefit investment

(5) Management considerations: policy, governance

- The most benefit will be recognized as the solution is rolled out to the field
- Can reduce costs associated with training of users for the rollout of COE
- Needs analysis with the user population is critical
- Consideration for tools that tightly integrate with group calendaring & scheduling standard

(6) Other considerations:

Services: Encryption

(1) Description/definition

Develop in accordance with unclassified cyber notice and enterprise security architecture data bits in digital signals.

(2) Action needed:

(3) Timelines:

(4) Benefits, costs and capital investment strategy

The Benefit of Encryption is that Executives will know that the data on the servers is secure.

(5) Management considerations: policy, governance

Encryption will mean that it may take longer to access and save data.

(6) Other:

Services: PKI

(1) Description/definition

Public key infrastructure is a combination of technology and business rules to ensure transactions are conducted in a secure manner with integrity and authenticity. The process starts with user identification and continues through ensuring integrity of the message being sent, security of the contents, and guarantee of delivery. PKI is commonly used to address the entire process rather than just the methodology for encryption. Implementation varies in the market place, from identification methodologies to certificate holders.

(2) Action needed:

Determine business requirements. Prepare an information and/or business transaction assessment to determine the level of acceptable risk and/or protection required.

(3) Timelines:

This should be a high priority and goes along with other security options.

(4) Benefits, costs and capital invesment strategy

The benefit for everyone is that the DOE data will be secure and people will have confidence in passing along sensitive data electronically as opposed to paper. This will further enhance your ability for people to use Email, GroupWare, etc.

(5) Management considerations: policy, governance

***(6) Other considerations*:**

links - http://www1.xcert.com/~marcnarc/PKI/thesis/thesis/thesis/contents.html

Services: Web Services:

Internet access
Intranet access
Extranet access
Web hosting
FTP and NNTP services
News services
User group services

(1) Description/definition

This would be similar to a commercial Internet Service Provider (ISP) like UUNET, AOL, Compuserve, Prodigy, etc. This could provide access to the web, and/or same services provided within an intranet (classified) environment

(2) Action needed:

DOE would need to specify services desired to negotiate with ISP of choice. Technology available to distribute real time radio, streaming video, etc in addition to secure socket layer implementation of electronic commerce. Service level agreements are critical. Security is significant consideration along with filering of access to inappropriate material/services.

(3) Timelines:

Not to Soon

Access to inter/intranet services available now. Getting on line with intranet type secure information sharing will bring significant improvements to sharing information and streamlining processes. Web-like enabled applications can increase effectiveness of legacy systems and access to archived data. Areas for improvement are integrity/authenticity of information and the use of sufficiently intelligent browsers to get the information required. Knowledge agents can be implemented to conduct research and construct MIS reporting.

(4) Benefits, costs and capital investment strategy

Everything on the net is rapidly approaching. Significant list of advantages for web-enabled application.

(5) Management considerations: policy, governance

Security is the biggest consideration when dealing with the Internet. This will have to be carefully looked at.

(6) Other considerations:

Services: Office Suite Software

(1) Description/definition

Office Suite software comprises of word processing, spreadsheet work, presentation software, e-mail client, and other daily office function packages.

(2) Action needed:

Establish schedule release per budget constraints.

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(3) Timelines:

The office suite software will be delivered to the users on a "Gold Disk" within 6 months or as budget constraints allow.

(4) Benefits, costs and capital investment strategy

User

Ease of use
Functionality
Data sharing

Manager

Easier to support.
Easier to train the entire DOE staff on one package
Staff becomes cross functional as the tools are standardized

Executive

Economies of Pricing for benefits with Enterprise license of the software
Reduce exposure related to software piracy

(5) Management considerations: policy, governance

Must provide training with union workers. DOE should engage in an Enterprise License Agreement. Where budget constraints prevent the 6 month target, all departments will include the migration in the next budget process, or re-prioritize existing budgets to deliver the office suite as a priority expenditure

(6) Other considerations:

Services: Office Automation

(1) Description/definition

Office Automation consists of standard database, document management, imaging , fax, project management, and graphics applications. These in combination with office suite software standard define the Common Office Environment, which is fully supported by the Centralized Support Team.

(2) Action needed:

Identify, adopt and distribute these as part of the "Gold Disk" process.

(3) Timelines:

In parallel with e-mail and file & print (i.e. w/I 24 months)

(4) Benefits, costs and capital investment strategy

User

Ease of use
Enhanced functionality
Facilitate data sharing

Manager

Easier to support.
Easier to train the entire DOE staff on one package
Staff becomes cross functional as the tools are standardized

Executive

Economies of scale pricing for benefits with Enterprise license of the software, which in the long run would save them money**.**
Reduce exposure related to software piracy

(5) Management considerations: policy, governance

- Consideration needs to be made on a per product basis as to how the application is delivered to the end-user (Server based, PC Based, Thin Client, etc.), how the licenses are tracked, and how usage is managed.
- Consideration must provide training with union workers.
- DOE should engage in an Enterprise License Agreement where possible.
- Training of support team & users.

(6) Other considerations:

Services: Thin Client

(1) Description/definition

Thin Client is an architecture based upon 100% Server Based computing. It includes the ability to centrally run all your everyday functions such as Email and Word Processing. Thin Client is an excellent solution to save you on your TCO. It will also shorten your time in deploying products.

(2) Action needed:

Invest in a array of Servers to design the thin client shop.

(3) Timelines:

If you are to go thin client, this would have to be one of your first actions. All other designs will need to take the design of thin client in mind. The advantage of doing this first is that deploying Email and other products on a large scale then happens much quicker.

A cut-over to thin client will require a lot of planning, but can be accomplished in a short time once the servers are built.

(4) Benefits, costs and capital investment strategy

The benefit is centralized management of the entire organization. You would have to invest heavily in Server Hardware and software, but could save significant money on not needing to replace workstations now or in the future. Also, if you did replace workstations you could replace them with thin client NCD boxes which are easier to support and much lower in cost (about half the cost of a workstation).

(5) Management considerations: policy, governance

If going thin client, you must make sure that the infrastructure can support the technology. Having good bandwidth, cabling, and a large server room (preferably with raised floors), is important to a successful design of thin client.

(6) Other considerations:

Services: Procurement Assistance

(1) Description/definition

Procurement assistance would be a centralized approach to purchasing, and delivering, all IT equipment to the DOE. They would have one contact on ordering equipment, on pre-established pricing.

For software, single selection of a vendor to get group licensing will need to be done as well.

(2) Action needed:

The DOE will need to select a single hardware platform to purchase off. It is more effective for purchasing pricing and support of the hardware.

(3) Timelines:

This will need to be done soon in the process, so the DOE can get pricing and delivery of new equipment before installations.

(4) Benefits, costs and captial investment strategy

The benefit of going with a single platform and vendor is that you can purchase equipment in bulk, on a made to order basis for a much lower cost than going with many vendors on small purchases. The DOE will save a lot of money in the long run by doing this.

(5) Management considerations: policy, governance

Management must consider what hardware will be projected to be purchased over the coming year. This will help in pricing if a hardware vendor such as Compaq knows that the volume each year is a certain amount. Compaq would then give pricing on large buys.

(6) Other:

Services: Training

(1) Description/definition

Training is teaching the end user and system administrator's how to do their day-to-day functions. Training is not done for each user once. Training should be on-going and always updated.

(2) Action needed:

Training classrooms should be setup with a regular selection of classes. A survey should be done to see what classes people would like to take. Classes should always be offered when the DOE migrates to new platforms such as Windows 2000, Outlook, MS Word, etc.

Customized training for workflow products and modules will need to be done as well. The more training someone gets, the more likely they are to use the product.

In addition to training classes, there should be on-line training classes which a employee can get training from their desk. There are software packages such as *Outreach Technologies Embrace* product which can accomplish this. The way it works is with either voice, text or both.

CBT's and documentation are also good sources of training. The DOE should stock a library of books and CBT's for employee useage.

(3) Timelines:

As stated above, training is on-going and should be done before or during a major deployment of a new product.

(4) Benefits, costs and capital investment strategy

Training benefits are that the user will feel more empowered to use the system and products. Without good training, people may shy away from new technologies which will make an investment not worth the cost. Research studies show the undertrained end-user consumes 2 to 6 times the technical support as an adequately trained end-user. The impact on total cost of ownership of not training end-users has been calculated at $7,000 per user.

Training will also help the system administrators do their jobs more effectively and therefore need outside vendors less. ROI on IT professional technical training is typically 125 to 175 per cent.

(5) Management considerations: policy, governance

A comprehensive training strategy must be plotted out before any deployment of any products happens. It is important to hit employees with as many different training methods and as many classes and documentation you can get to them.

(6) Other considerations:

Just-in-time training is preferred

Use of CBTs lowers training cost per employee

Services: Naming Services (WINs, DNS, DHCP)

(1) Description/definition

DNS is the distributed namespace used on the Internet and intranets to resolve computer and service names to TCP/IP addresses. Most enterprises with intranets use DNS as the name resolution service.

WINS is a Microsoft proprietary dynamic database maintenance to support computer name registration and name resolution. Although WINS provides dynamic name services, it offers a NetBIOS namespace, making it much more flexible than the Domain Name System (DNS) for name resolution.

(DHCP)Dynamic Host Configuration Protocol

These services will be delivered through the enterprise management function.

(2) Action needed:

All Naming Services will be designed, coordinated and maintained by the Infrastructure Support Team. This team recommends primary DNS services be maintained on the NT platform with distributed DNS to other platforms as required.

(3) Timelines:

With the implementation of NT 200X (w/in 24 months)

(4) Benefits, costs and capital investment strategy

User

Stability
Reliability

Management

Better Security
Cost to maintain

(5) Management considerations: policy, governance

In Windows 2000, a domain defines both an administrative boundary and a security boundary for a collection of objects that are relevant to a given group of users on a network. The integration and reliance of NT 200x on DNS and the DOE's stated goal to standardize on Microsoft NT requires careful consideration of how naming services are implemented, and on what platforms they are provided from (NT, UNIX, ETC)

Establish Naming Conventions, process for assigning name.

(6) Other considerations:

Services: Domain Management

(1) Description/definition

Domain management is creating and planning the DNS namespace, domain hierarchy, and organizational unit structure

(2) Action needed:

Set standard for computer names and Server name.

(3) Timelines:

This must be one of first things you do before you build any machines.

(4) Benefits, costs and capital investment strategy

It will save time in long run as you will not have revisit every machine and Server to bring it up to standard. It will also help you see how your organization is structured and growing.

(5) Management considerations: policy, governance

How you expect the organization to grow.

(6) Other considerations:

prerequisites: A good understanding of the organization structure and its work environment.

Services: Unified Messaging (fax and voice mail at desktop)

(1) Description/definition

These systems provide universal mailboxes that support voicemail, fax, and email; they will soon support video as well.

With unified messaging, you can enjoy universal access to your messages at the office, on the road, and at home. Using Outlook's GUI, you can scan your inbox messages and read only the most important ones, quickly filing the others away for later review. Using a telephone user interface (TUI—an interface that lets you use a touch-tone phone to control a CT application), you can listen to your email and even many of your fax messages from any telephone.

(2) Action needed:

Unified messaging systems based on NT can help employees save time. A single user directory streamlines systems administration tasks. It cuts in half the time spent configuring, supporting, and maintaining separate voice, fax, and email directories. This can be achieved using Exchange Server 5.5.

(3) Timelines:

This is available right now. There are a number of Fax server options to use through Exchange right from the desktop. There is even a codex converter that will send you voice mail to your mail account.

(4) Benefits, costs and capital investment strategy

Less training needed - the user only have to use one application to provide all their messaging needs. Messages can be accessed from anywhere in the world via the phone or the Internet. With CTI equipment we would recommend leasing with the NT device - better to buy them and incorporate everything into your existing structure.

(5) Management considerations: policy, governance

Security is big concern for a Company but access and exchange of information are just as important as it is the key to staying ahead in the world of today fast moving environment.

(6) Other considerations:

One fax-server farm can support 96 or more faxing ports. (For more products that can perform faxing and other applications, see the "Computer Telephony Buyer's Guide" on the Windows NT Magazine Web site, http://www.winntmag.com

Services: Voice Services

(1) Description/definition

Voice Services including cellular services, and audio conferencing are currently defined and centrally managed and are consistent with industry standards.

(2) Action needed:

No changes at this time

(3) Timelines:

N/A

(4) Benefits, costs, capital investment strategy

(5) Management considerations: policy, governance

The level of excellence currently provided in this area is specifically related to the fact this is a centrally managed, and maintained function. This service represents the model outcome for centralizing and standardizing other services.

Need more attention to the current billing and collection process.

(6) Other considerations:

Services: Directory Services

(1) Description/definition

A directory is used to manage and authenticate users and other objects in a networked environment. For example, a basic directory is used to manage users and their access rights in email systems, multi-user accounting applications, and groupware tools.

(2) Action needed:

Standardize on a single "Master" directory service which is distributed and replicated as required. Where possible all applications or services, which require or utilize a directory must pull objects from the "Master" directory i.e. E-mail, LDAP, Yellow Pages, Security Access.

The Master Directory will be designed, coordinated and maintained by the Infrastructure Support Team. Rights to perform MAC's associated with the Directory will be distributed to the local support team lead.

(3) Timelines

12 months

(4) Benefits, costs and capital investment strategy

User

Accuracy
Transparency
Reliability
Ability to find resources
Enhance remote access performance

Manager

Reduce complexity
Simplify development
Enables virtual workgroups
Interoperability with other directory service
Security easier to manage

(5) Management considerations: policy, governance

We must get concurrence in headquarters, then distribute out to the Labs.
Microsoft ADS is the natural choice as the Master directory, but is not in production today.

(6) Other considerations:

Services: Multicasting/Broadcasting

(1) Description/definition

multicast, or "true push," in Internet Explorer 4.0

Broadcast Architecture for Windows® initiative will allow PC users to receive CDF-authored Channel content over existing and future broadcast networks, including high-bandwidth direct broadcast satellites, as well as analog and cable TV channels. This means that without dialing up or otherwise using a two-way connection to the Internet, Channel content will be kept constantly fresh on users' PCs. In addition, Microsoft's relationship with AirMedia promises to make Channel content available to home users everywhere via air waves.

(2) Action needed:

Bandwidth must be considered in using this technology effectively. Select commercial service provider, flexible response to include commerical information content, control advertising/makreting, incorporate internal information requirements. Determine "push" vs subscription events/triggers (i.e. point cast). Implement via intranet and/or internet, but need to consider risk assessment on access to networks. Need to develop consistent business rules and fee for service, plus operational and technical architectures. Implementation requires assessment of impact on network capacity, processing times, and security (distribution/download of executables).

(3) Timelines:

Soon to Later for implementation

Business rules and security considerations are driving factors. Internet commercial applications can push information currently to many platforms, so service can be hardware independent. Business case, return on investment necessary since other methods will become available for information distribution as infrastructure becomes standardize.

(4) Benefits, costs and capital investment strategy

Cost range, low to medium

Impact on process, similar to web page development, information needs to be time sensitive and relevant. Process for information approval, release-distribution and normalize with current process to avoid setting up separate methodology critical to success. Integrate with current public affairs process, bulletin boards, and other information periodicals.

(5) Management considerations: policy, governance

Policy needs to address commercial service providers, advertisements as part of the service, and content availability - censorship/access/security. Do needs assessment for information distribution, and determine criteria for push/pull applications.

(6) Other considerations:

In-house programs broadcasting

Services: CTI (computer telephony integration)

(1) Description/definition

CTI (computer-telephony integration), or sometimes simply "computer telephony," is the use of computers to manage telephone calls. The term is used in describing the computerized services of call centers, such as those that direct your phone call to the right department at a business you're calling. It's also sometimes used to describe the ability to use your personal computer to initiate and manage phone calls (in which case you can think of your computer as your personal call center).

CTI applications provide the ability to do one or more of the following:

- Authenticate callers. Using one of several standard methods, the telephone number of the caller can be screened against a database.
- Recognize a voice, either for authentication or for message forwarding
- Using live, recorded voice, or touch-tone entered input, determine how to process a call (for example, by forwarding it to the appropriate person or department)
- Provide interactive voice response (IVR) to callers
- Match the number of a caller with a customer record and display it for reference when talking to the caller
- Manage voice or video conferences
- Collect and display pending live calls or messages that have been left by callers
- Receive fax messages and route them to appropriate fax machines
- For outbound calling such as telemarketing, predial callers
- Based on call input, initiate a smart agent application to provide help with the caller's request

The Advanced Intelligent Network (AIN) is a telephone service architecture that separates CTI services from call switching and will make it easier to add new services. The Windows Telephony Application Program Interface (TAPI) and Novell's TSAPI are programming interfaces intended to make it easier to create applications that enable telephone services on a personal computer or in a local area network.

(2) Action needed:

The DOE will need to select vendor who will provide this technology. There are many different types of features and costs that go along with this technology. The DOE will need to consider what their goals with the technology are for a help desk, answering service, etc. Also, the bandwidth (T1 line) must be considered.

If this is used strictly for the phone system, then this can be implemented at any time.

(3) Timelines:

If this is to be used for a help desk, phone messaging system, etc, you should have this up before any real deployment of new product or system changes are done.

(4) Benefits, costs and capital investment strategy

An excellent CTI solution can help provide your users with a better way to communicate within and outside the DOE. It can also be used as an effective setup for a call center which will enhance the response time of picking up and resolving calls.

(5) Management considerations: policy, governance

With the amount of features that are you can get with CTI, careful planning must be considered.

(6) Other considerations:

links http**://www.computertelephony.org/**